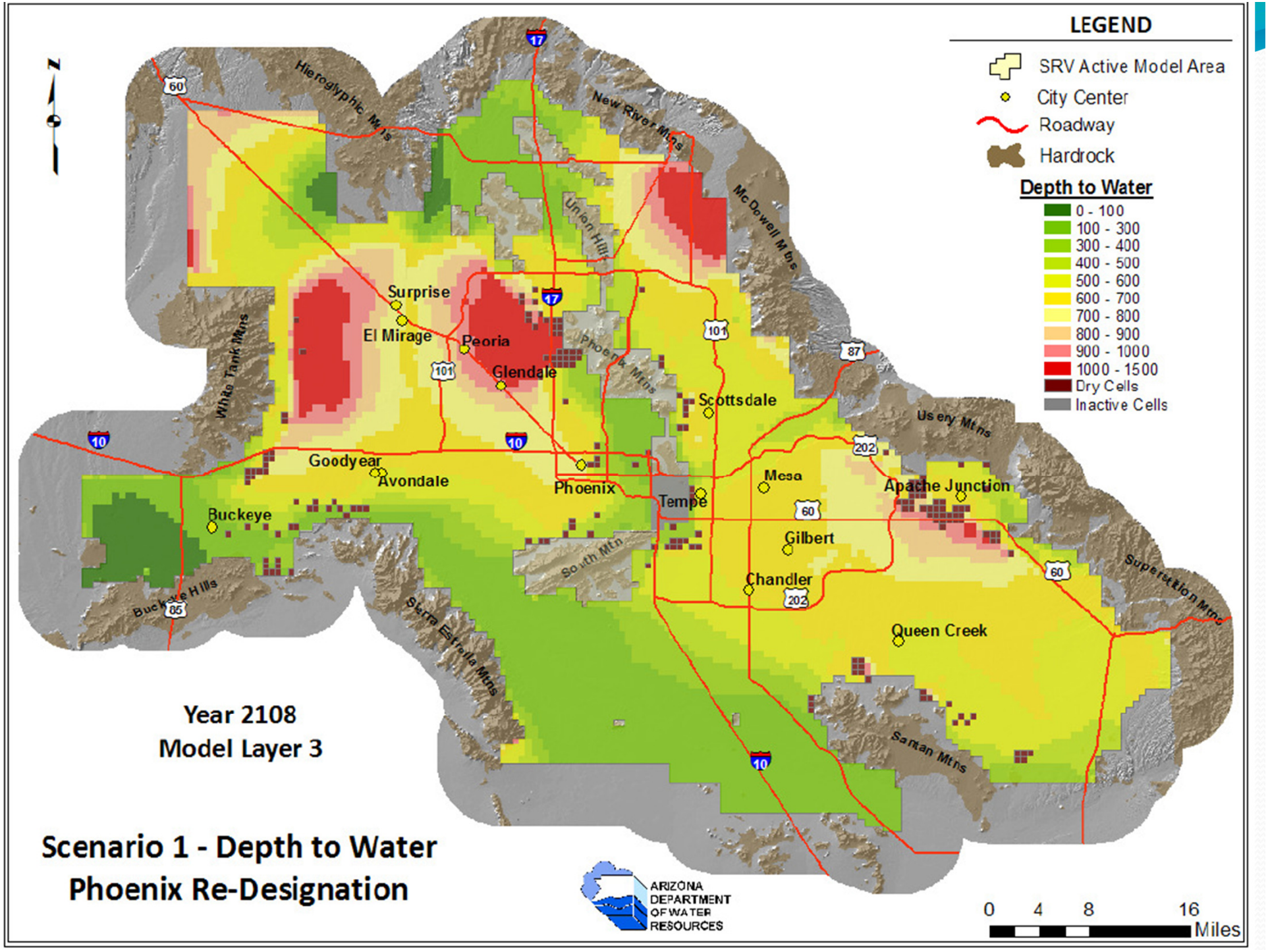
Phoenix AMA Re-Designation Scenarios

ADWR Enhanced Aquifer Management

Stakeholder Meeting #3

December 18, 2013


LEGEND
SRV Active Model Area
City Center
Roadway
Hardrock
Depth to Water
0 - 100
100 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
900 - 1000
1000 - 1500
Dry Cells
Inactive Cells
N
Hieroglyphic Mts
New River Mts
McDowell Mts
Union Hills
White Tank Mts
Phoenix Mts
Usery Mtns
Superstition Mtns
South Mtn
Buckeye Hills
Sierra Estrella Mtns
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Tempe
Mesa
Apache Junction
Buckeye
Gilbert
Chandler
Queen Creek
17
10
101
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87
202
85
Year 2108
Model Layer 3
Scenario 1 - Depth to Water
Phoenix Re-Designation
ARIZONA DEPARTMENT OF WATER RESOURCES
0 4 8 16
Miles

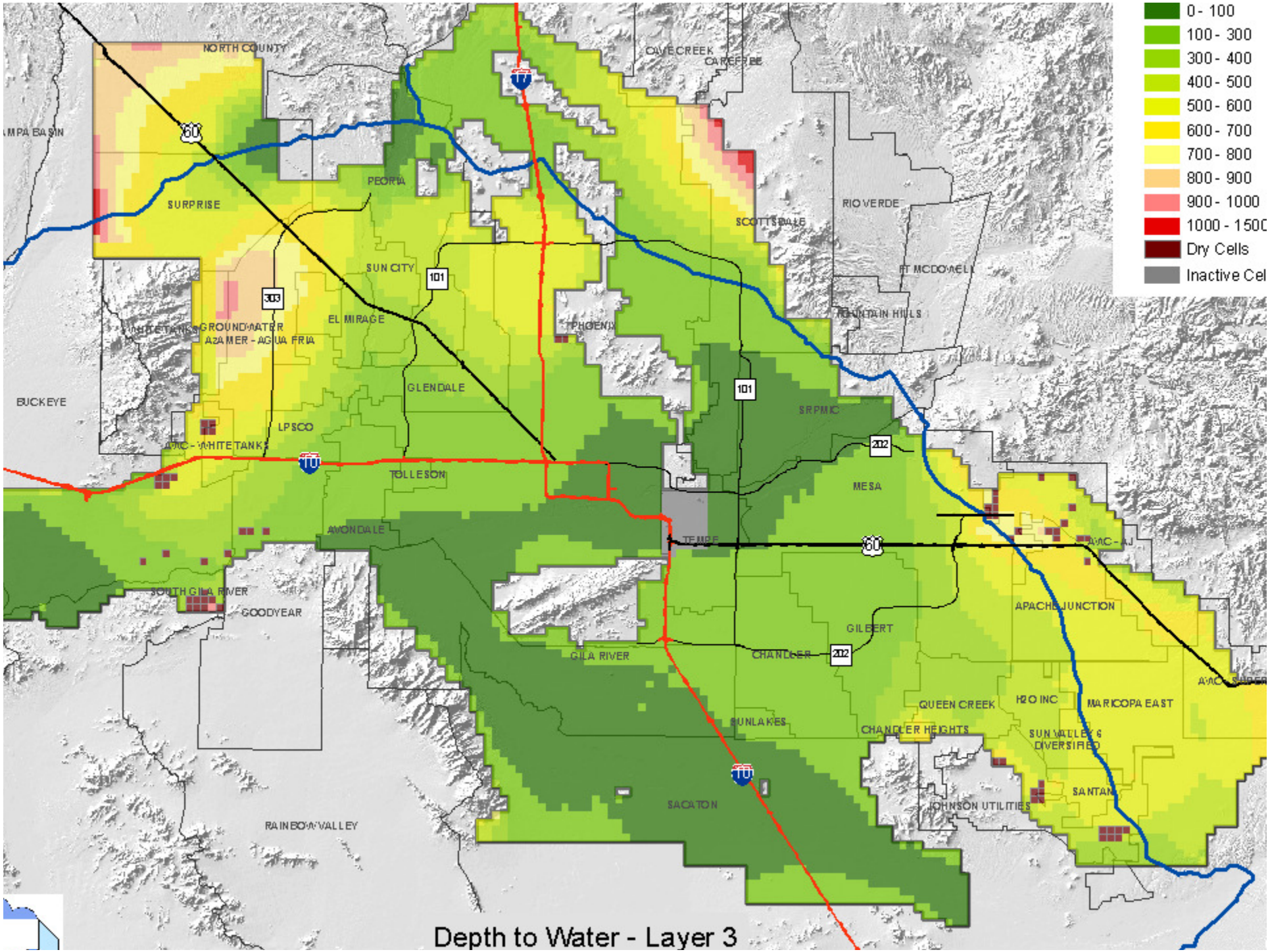
AWS Base Scenario

Pumping:

- Current 2010 Designated Volumes
- Current AWS Approved Demands
- SRP Pumping – 23 year Average and Submitted Projected Recovery

Recharge:

- Applicants Available Surface Water
- Projected CAGRD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Dry Cells
Inactive Cel
NORTH COUNTY
CAVE CREEK
CAREFREE
SURPRISE
PEORIA
SUN CITY
SCOTTSDALE
RIO VERDE
FT MCDOWELL
EL MIRAGE
GROUNDWATER
AZAMER - AGUA FRIA
GLENDALE
BUCKEYE
LPSCO
SRPMIC
TOLLESON
MESA
AVONDALE
TEMPE
SOUTH GILA RIVER
GOODYEAR
APACHE JUNCTION
GILBERT
GILA RIVER
CHANDLER
QUEEN CREEK
H2O INC
MARICOPA EAST
SUNLAKES
CHANDLER HEIGHTS
SUN VALLEY 6
DIVERSIFIED
JOHNSON UTILITIES
SACATON
RAINBOW VALLEY
60
101
303
10
202
Depth to Water - Layer 3

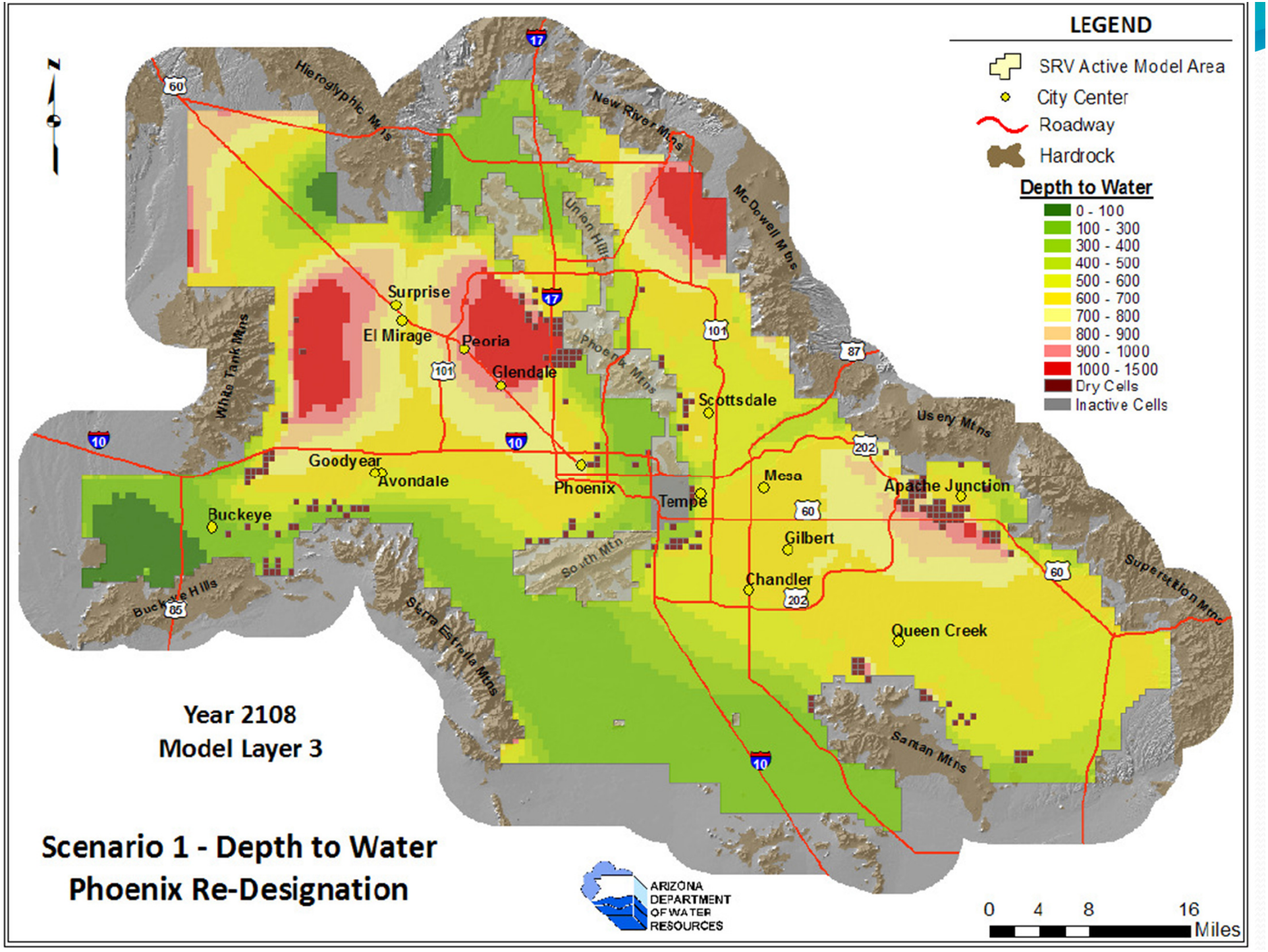
Scenario 1

Pumping:

- Applicants Submitted Pumping Volumes
- Current AWS Approved Demands
- SRP Pumping – Submitted Projected Pumping and Recovery

Recharge:

- Applicants Submitted Recharge Volumes
- Projected CAGRD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Year 2108
Model Layer 3
Scenario 1 - Depth to Water
Phoenix Re-Designation
ARIZONA DEPARTMENT OF WATER RESOURCES
0 4 8 16
Miles

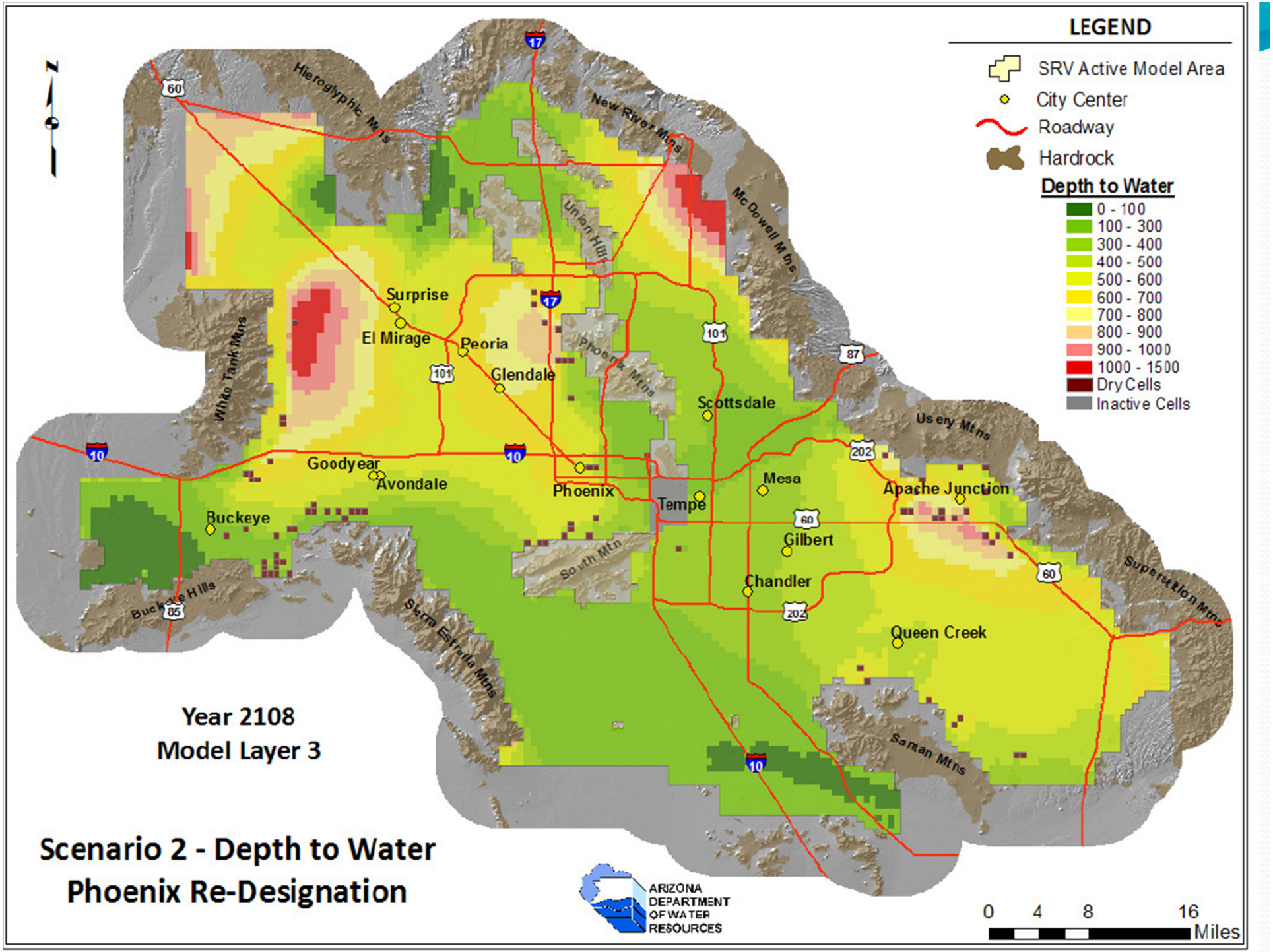
Scenario 2

Pumping:

- 2025 demands with 80% direct use of Surface Water and a 15% Pumping allowance
- Current AWS Approved Demands
- SRP Pumping – 23 year Average and Submitted Projected Recovery

Recharge:

- Applicants Available Surface Water and Effluent
- Projected CAGRD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Model Layer 3
Scenario 2 - Depth to Water
Phoenix Re-Designation
ARIZONA DEPARTMENT OF WATER RESOURCES
0 4 8 16
Miles

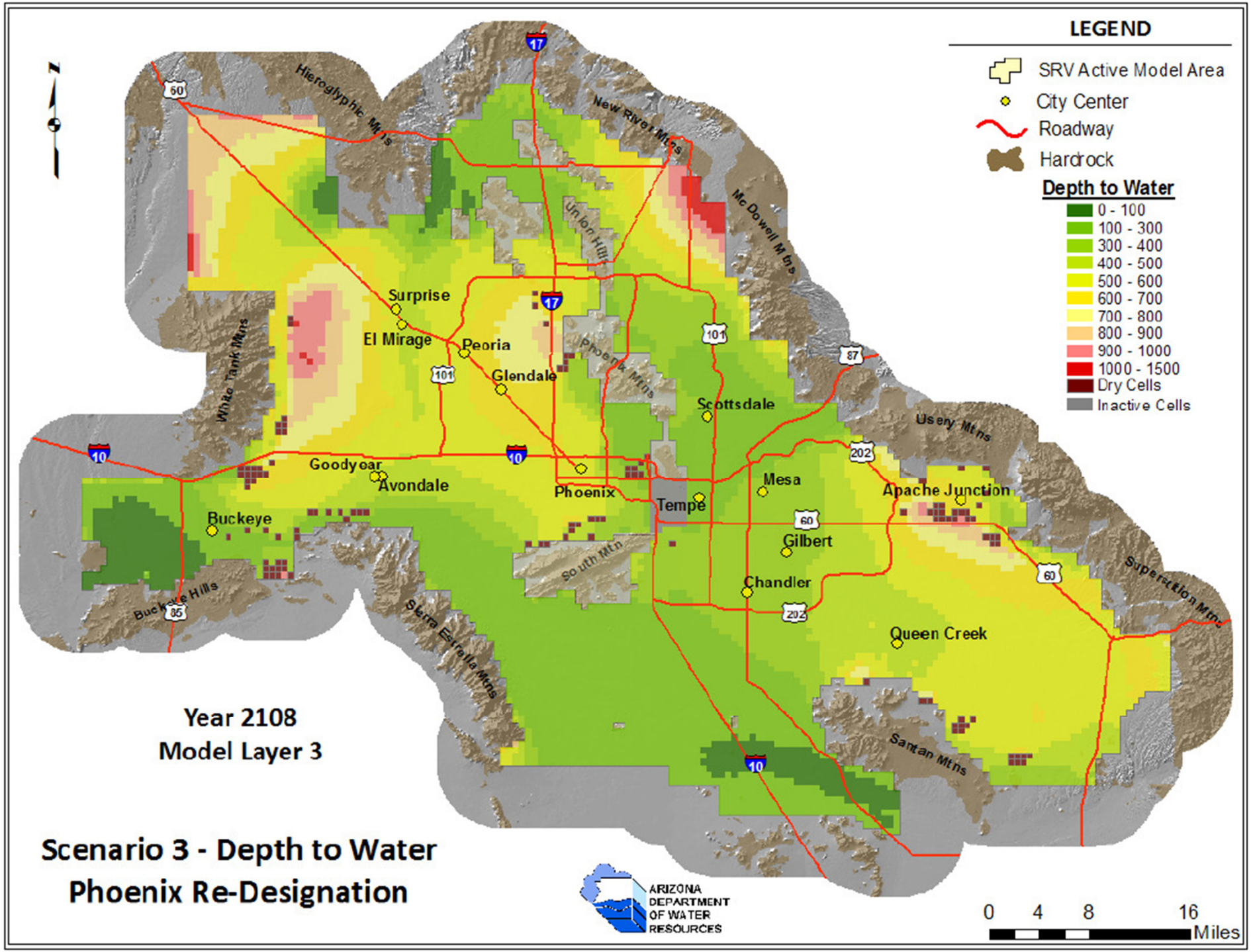
Scenario 3

Pumping:

- 2020 demands with 80% direct use of Surface Water and a 10% Pumping allowance
- Current AWS Approved Demands
- SRP Pumping – 23 year Average and Submitted Projected Recovery

Recharge:

- Applicants Available Surface Water and Effluent
- Projected CAGRD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Usery Mtns
Superstition Mtns
South Mtn
Buckhorn Hills
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Santan Mtns
Surprise
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Peoria
Glendale
Scottsdale
Goodyear
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Phoenix
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Chandler
Queen Creek
Year 2108
Model Layer 3
Scenario 3 - Depth to Water
Phoenix Re-Designation
ARIZONA DEPARTMENT OF WATER RESOURCES
0 4 8 16
Miles

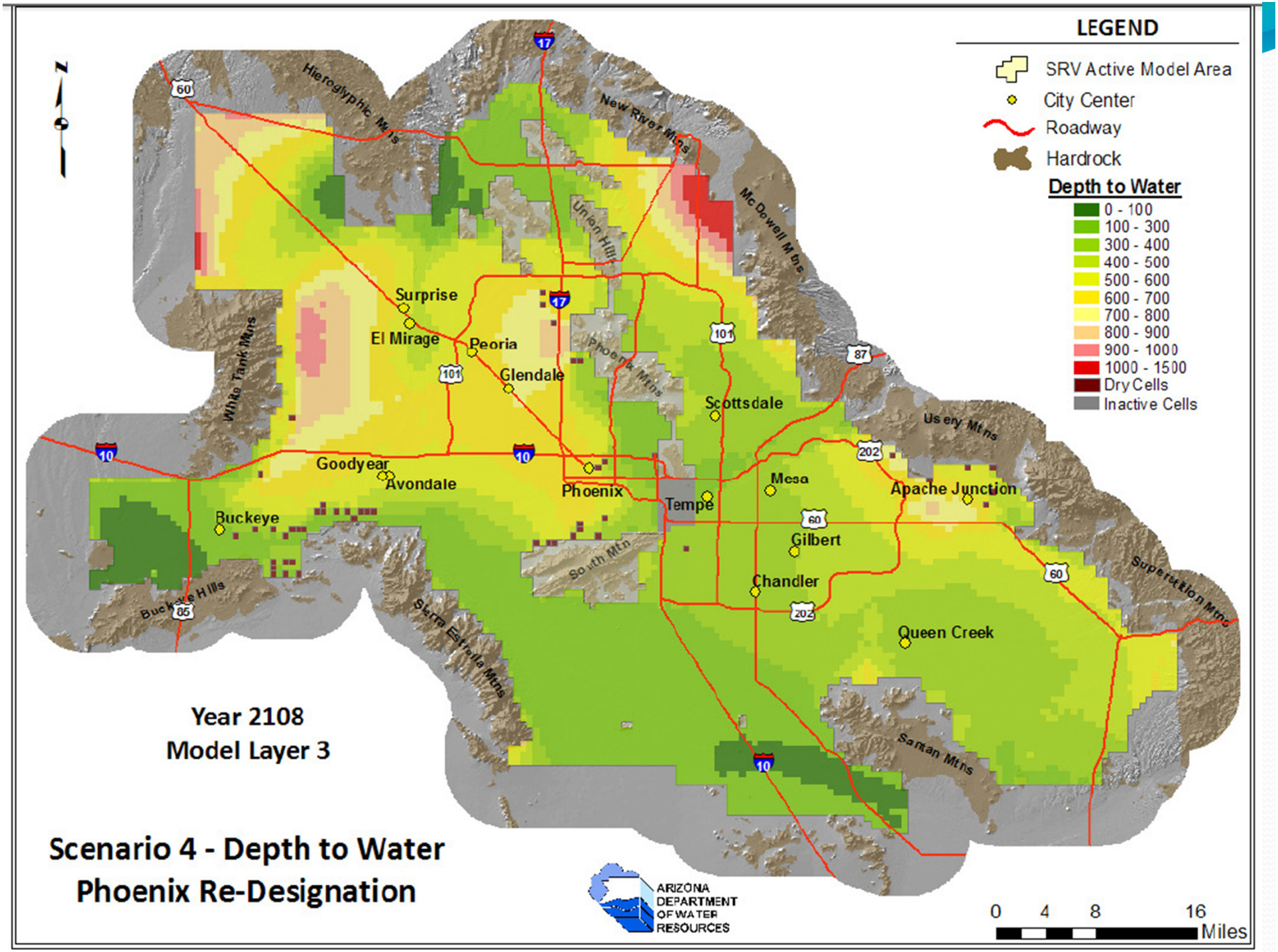
Scenario 4

Pumping:

- Additional recovery of LTSC within "Safe Harbor" of USFs

Recharge:

- Additional recovery of LTSC within "Safe Harbor" of USFs
- Applicants recharge at facilities with associated recovery wells
- CAGRD recharge moved from Hassayampa to Superstition Mountain USF in ESRV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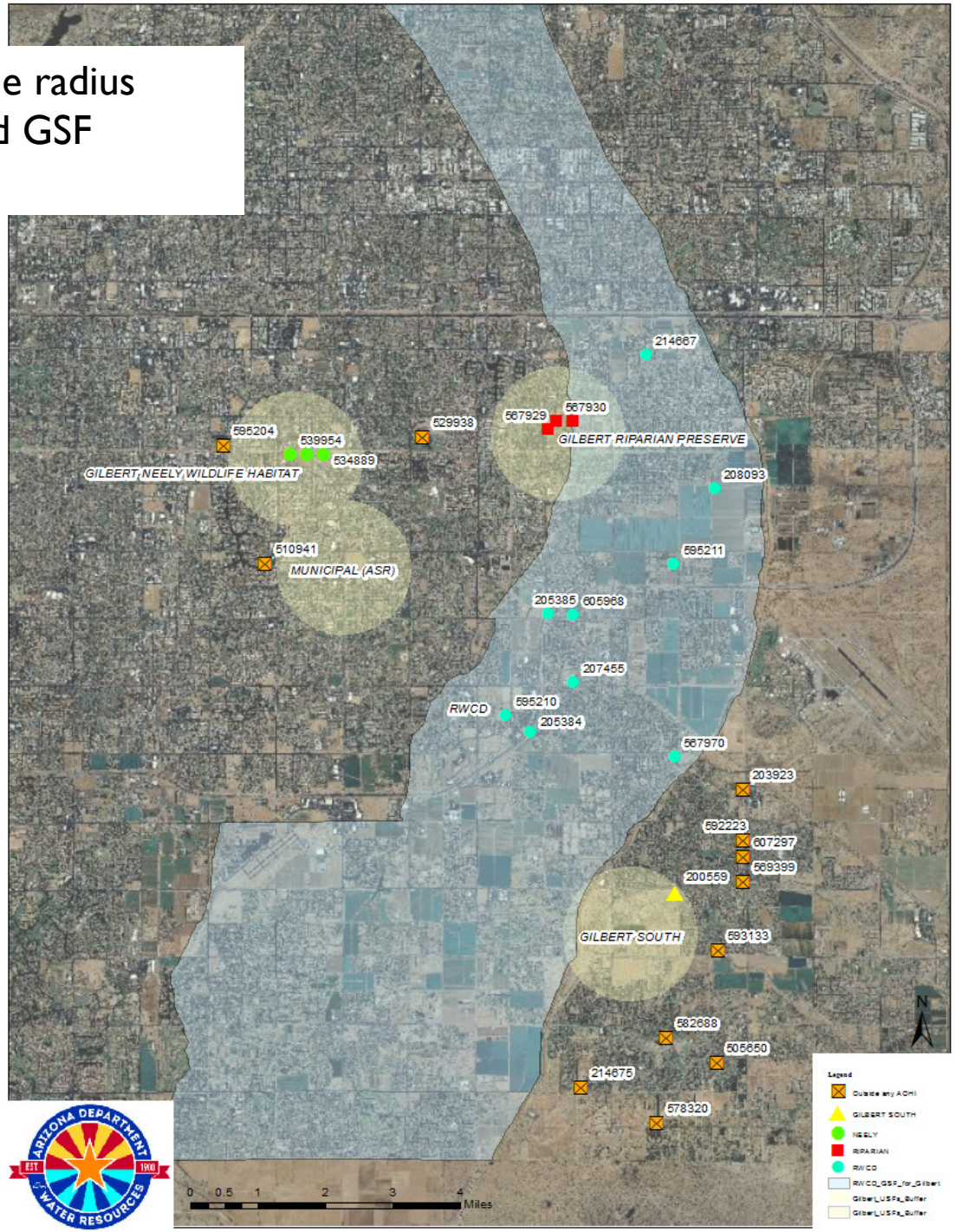
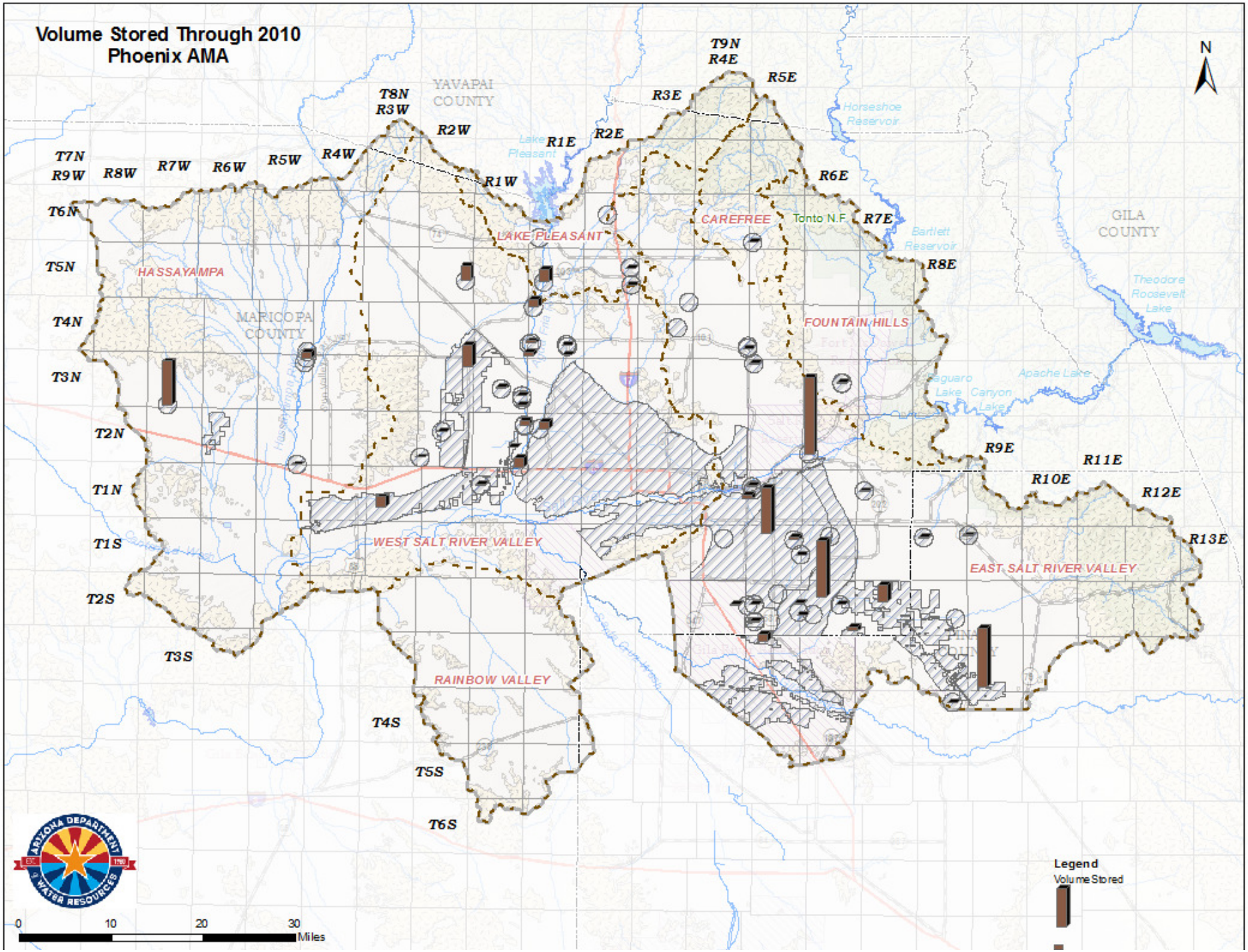
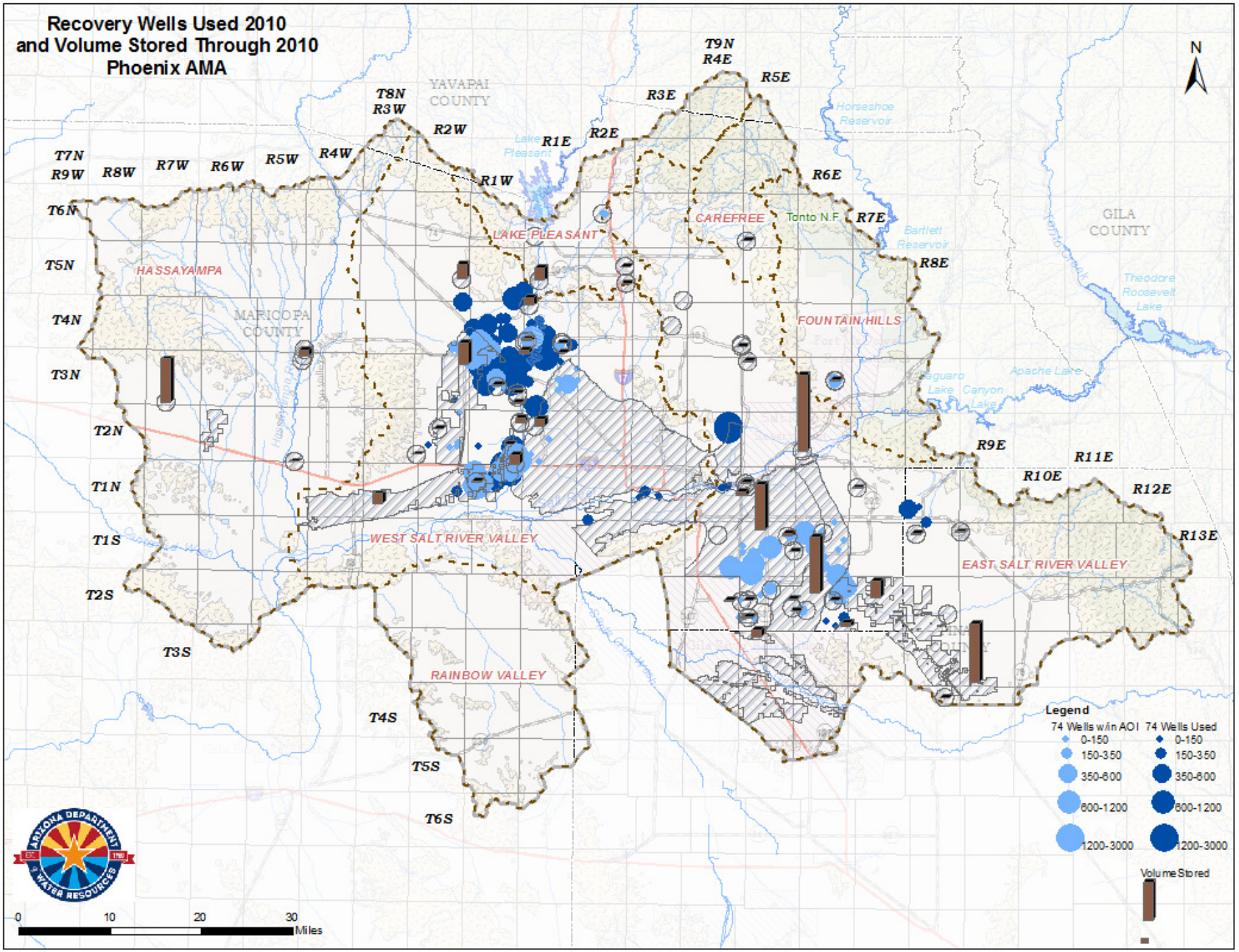
Scenario 4 - Depth to Water
Phoenix Re-Designation
ARIZONA DEPARTMENT OF WATER RESOURCES
0 4 8 16
Miles

Example of 1-mile radius around USFs, and GSF boundary




Volume Stored Through 2010
Phoenix AMA
N
YAVAPAI COUNTY
MARICOPA COUNTY
GILA COUNTY
HASSAYAMPA
LAKE PLEASANT
CAREFREE
FOUNTAIN HILLS
WEST SALT RIVER VALLEY
EAST SALT RIVER VALLEY
RAINBOW VALLEY
Horseshoe Reservoir
Bartlett Reservoir
Theodore Roosevelt Lake
Apache Lake
Canyon Lake
Tonto N.F.
T9N R4E
R5E
T8N R3W
R3E
R2W
R1E
R2E
T7N R9W
R8W
R7W
R6W
R5W
R4W
R1W
R6E
T6N
R7E
T5N
R8E
T4N
T3N
T2N
R9E
R11E
T1N
R10E
R12E
T1S
R13E
T2S
T3S
T4S
T5S
T6S
Legend
Volume Stored
0
10
20
30
Miles


Recovery Wells Used 2010
and Volume Stored Through 2010
Phoenix AMA
N
YAVAPAI COUNTY
MARICOPA COUNTY
GILA COUNTY
HASSAYAMPA
LAKE PLEASANT
CAREFREE
FOUNTAIN HILLS
WEST SALT RIVER VALLEY
EAST SALT RIVER VALLEY
RAINBOW VALLEY
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Horseshoe Reservoir
Bartlett Reservoir
Theodore Roosevelt Lake
Apache Lake
Canyon Lake
Saguaro Lake
T9N
T8N
T7N
T6N
T5N
T4N
T3N
T2N
T1N
T1S
T2S
T3S
T4S
T5S
T6S
R4E
R5E
R3E
R3W
R2W
R1E
R2E
R1W
R4W
R5W
R6W
R7W
R8W
R9W
R6E
R7E
R8E
R9E
R10E
R11E
R12E
R13E
Legend
74 Wells w/in AOI
74 Wells Used
0-150
150-350
350-600
600-1200
1200-3000
Volume Stored
0
10
20
30
Miles

1-mile "Safe Harbor"

Advantages:

- **Certainty**
- **Administrative**

Disadvantages:

- **Arbitrary**
- **Could be restrictive**

AOHI (Area of Hydrologic Impact)

Advantages:

- **Hydrologically based**

Disadvantages:

- **Excessively burdensome to administer**
- **Lag time until calculated**
- **Constantly changing**

Phoenix AMA 07/03/13

Recharge/Recovery	Storage & Recovery Outside SEA*		Water Stored at a CUSF Within a SEA**	Water Stored Outside a SEA and Recovered Within a SEA
Location	Effluent	Other Water Types	All Water Types	All Water Types
Recovery **in the same** sub-basin	• 100% if CUSF or GSF • 50% if MUSF	• 95% of LTSC if CUSF or GSF • 100% of AS&R if CUSF, MUSF or GSF	• 115% of LTSC or AS&R if recovered outside SEA • 100% of AS&R if recovered within SEA • 95% of LTSC if recovered within SEA	• 80% of LTSC or AS&R
Recovery **not in the same** sub-basin	• 80% if CUSF or GSF • 50% if MUSF	• 80% of LTSC if CUSF or GSF • 80% of AS&R if CUSF, MUSF or GSF	• 80% of LTSC or AS&R	• 80% of LTSC or AS&R

Replenishment	Replenishment at CUSF or GSF Outside SEA*	Replenishment at CUSF Within a SEA**
Location	All Water Types	All Water Types
Excess Groundwater Pumped **In the Same Sub-basin** of Replenishment	• 100% if Pumping was not in SEA • 120% if Pumping was in SEA	• 85% if Pumping was not in SEA • 100% if Pumping was in SEA
Excess Groundwater Pumped **Outside the Sub-basin** of Replenishment	• 120% for all Pumping	• 120% for all Pumping

Acronyms:
SEA- Special Enhancement Area
CUSF-Constructed Underground Storage Facility
MUSF-Managed Underground Storage Facility
GSF-Groundwater Savings Facility
LTSC- Long Term Storage Credit
AS&R-Annual Storage and Recovery

NOTES: CAGRD's use of long-term storage credits in the replenishment reserve account to meet replenishment obligations will be treated as if CAGRD had replenished the water if the credits were accrued after the effective date of these concepts.
Long-term storage credits accrued prior to the effective date of these concepts are exempt.

* For purposes of this concept, because the Agua Fria Underground Storage Facility stores water in both the Lake Pleasant and West Salt River Valley sub-basins, these sub-basins will be deemed to be one sub-basin for recovery of water stored at the Agua Fria Underground Storage Facility.

** It is assumed that there will be no managed underground storage facilities or groundwater savings facilities in a SEA.

Questions?

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